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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,205	01/25/2002	Sion C. Quinlan	500986.02	1725

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EXAMINER

GEYER, SCOTT B

ART UNIT	PAPER NUMBER
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2829

DATE MAILED: 04/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/057,205

Applicant(s)

QUINLAN ET AL.

Examiner

Scott B. Geyer

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 81-85 and 90-93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 81-85 and 90-93 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The prior office action rejected all pending claims 81-85 and 90-93 under 35 USC 112, second paragraph.

Claims 81-85, 90, 91, and 93 were listed as rejected under the cited art. However, the rejection of claim 91 (paragraph 11D) should have been the rejection for claim 92. Therefore, in the previous office action, no art was applied to the rejection of claim 91.

Due to the amendment to the independent claims, new grounds of rejection are necessitated as outlined below. Further, the subject matter of claim 91 is noted as allowable, as outlined below in paragraph 10. Although claim 91 was not previously rejected using prior art in the previous office action, the claim was nonetheless rejected under 35 USC 112, second paragraph. Combined with the necessity of new grounds of rejection due to the claim amendments, this office action is still FINAL.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

3. The previous office action indicated the drawings as objected to because they included reference numerals not mentioned in the specification. In response, the applicant has properly amended the specification to include those reference numerals, thereby overcoming the drawing objections.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 81-85 and 90-93 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5A. As to claim 81: the preamble of this claim recites “a method of conductively isolating modules within an integrated circuit package assembly”. However, the claim does not disclose whether the term “conductive” is meant to be electrically-conductive or heat-conductive. For purposes of examination, the examiner will assume that the claim refers to electrically conductive isolation. Furthermore, the body of the claim recites *conductively coupling* the first module to a first conductive surface and conductively coupling the second module to a second conductive surface, wherein the drawings and specification describe the two conductive surfaces as a capacitor structure (along with the dielectric layer). The two modules are capacitively electrically connected to each other, and therefore are not electrically isolated. For purposes of examination, the examiner will assume claim 81 describes using a decoupling capacitor, and the preamble will not be given any patentable weight. Claims 82-84 are also rejected on the same grounds as claim 81, since they are dependent upon claim 81 and necessarily contain all of the limitations of claim 81.

5B. As to independent claim 85: the preamble of this claim recites “a method of conductively isolating modules within an integrated circuit package assembly”.

However, the claim does not disclose whether the term "conductive" is meant to be electrically-conductive or heat-conductive. For purposes of examination, the examiner will assume that the claim refers to electrically-conductive isolation. Furthermore, the body of the claim recites forming a capacitor within the package assembly and coupling the first and second modules to the capacitor. Therefore, the two modules are capacitively electrically connected to each other, and therefore are not electrically isolated. For purposes of examination, the examiner will assume claim 85 describes using a decoupling capacitor, and the preamble will not be given any patentable weight. Claims 90-93 are also rejected on the same grounds as claim 85, since they are dependent upon claim 85 and necessarily contain all of the limitations of claim 85.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 81-85, 90 and 92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lauffer et al. (5,027,253) in view of Newman (5,068,708).

7A. As to **claim 81**, Lauffer et al. teach in figure 2 a module 235 attached to a substrate and a capacitor, having two conductive layers and a dielectric layer (numerals 125, 135, 151), attached beneath the substrate. The decoupling capacitor is conductively coupled to the module. Lauffer et al. do not specifically teach two modules attached to the first side of a substrate and coupled to the capacitor, nor does Lauffer et

Art Unit: 2829

al. teach the first and second modules having ground planes. However, Newman teaches integrated circuit structures (i.e. modules) having ground planes (see column 1, lines 5-20). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Lauffer et al. with a second module so as to increase the functionality of the package assembly (see also col. 1, lines 45 et seq.), and it would have been obvious to one of ordinary skill in the art to modify the modules of Lauffer et al. with ground planes as taught by Newman so as to reduce inductance and increase the speed of the device.

7B. As to **claims 82-84**, Lauffer et al. teach encapsulated packages, using polymers, ceramics or glass (see column 1, lines 7-21), which are all notoriously well known in the art of semiconductor manufacturing.

7C. As to **claim 85**, Lauffer et al. teach in figure 2 a module 235 attached to a substrate and a capacitor, having two conductive layers and a dielectric layer (numerals 125, 135, 151), attached beneath the substrate. The decoupling capacitor is conductively coupled to the module. Lauffer et al. do not specifically teach two modules attached to the first side of a substrate and coupled to the capacitor, nor does Lauffer et al. teach the first and second modules having ground planes. However, Newman teaches integrated circuit structures (i.e. modules) having ground planes (see column 1, lines 5-20). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Lauffer et al. with a second module so as to increase the functionality of the package assembly (see also col. 1, lines 45 et seq.), and it would have been obvious to one of ordinary skill in the art to modify the modules of Lauffer et

al. with ground planes as taught by Newman so as to reduce inductance and increase the speed of the device.

7D. As to **claim 90**, Lauffer et al. teach a module(s) attached to one side of a substrate and a capacitor attached to the other side of the substrate, as detailed above in the rejection for claim 85.

7E. As to **claim 92**, Lauffer et al. teach a module(s) attached to one side of a substrate and a capacitor attached *proximate* to the module(s), as detailed above in the rejection for claim 85.

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8. Claims 85 and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin ("Decoupling Capacitor Structure to Reduce FET Output Driver Switching Noise", December 1, 1987), hereinafter referred to as "IBM-87" in view of Newman (5,068,708).

8A. As to **claim 85**, IBM-87 teach forming a decoupling capacitor within an assembly wherein a first module (i.e. FET module) 10 is attached to one side of the decoupling capacitor 14 and a second module (i.e. FET module) 12 attached to a second side of the decoupling capacitor 14, as can be clearly seen in figure 1. IBM-87 do not teach the first and second modules having ground planes. However, Newman teaches integrated circuit structures (i.e. modules) having ground planes (see column 1, lines 5-20). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the modules of IBM-85 with ground planes as taught by Newman so as to reduce inductance and increase the speed of the device.

8B. As to **claim 90**, IBM-87 teach the decoupling capacitor 14 and two modules 10 and 12 on the same side of a substrate, as can be seen by the top down view of figure 2.

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9. Claims 85 and 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin ("Clipped Decoupled Twin-Carrier Module for IC Memory Chips", January 1, 1985), hereinafter referred to as "IBM-85" in view of Newman (5,068,708).

9A. As to **claim 85**, IBM-85 teach forming a decoupling capacitor within an assembly wherein the capacitor 2 is coupled to the first and second modules 4 (i.e. chip modules) and is located between the two modules. IBM-85 do not teach the first and second modules having ground planes. However, Newman teaches integrated circuit structures (i.e. modules) having ground planes (see column 1, lines 5-20). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the modules of IBM-85 with ground planes as taught by Newman so as to reduce inductance and increase the speed of the device.

9B. As to **claim 93**, IBM-85 teach the capacitor 2 located between the first and second chip modules 4 (see figures 1 or 2).

Allowable Subject Matter

10. Claim 91 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form *including all of the limitations of the base claim and any intervening claims*. The prior art of record and to the examiner's

knowledge does not teach or render obvious, at least to the skilled artisan, the instant invention regarding forming a capacitor on one side of a substrate and forming the two modules on the second side (opposite side) of the substrate, as recite in claim 91.

Response to Arguments

11. Applicant's arguments with respect to claims 81-85 and 90-93 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

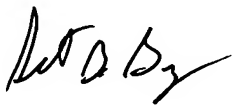
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott B. Geyer whose telephone number is (571)

272-1958. The examiner can normally be reached on weekdays, between 10:00am - 6:30pm. E-mail: scott.geyer@uspto.gov

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 4.12.04
SBG
April 12, 2004


ERNEST KARLSEN
PRIMARY EXAMINER